

REMARKS

Claims 1-14 are all the claims pending in the application. Claims 11 and 14 are amended herein to more clearly define the invention, and in accordance with the Examiner's suggestion. The Amendment does not constitute new matter and does not present issues which require further search. Entry of the Amendment is respectfully requested.

I. Response to Claim Objections

Claims 11 and 14 are objected to because the phrase "a green light and a red light" is allegedly indefinite. The Examiner suggests using the adjectives "first" and "second" to more clearly define the claimed subject matter and to provide proper antecedent basis for "the green light" and "the red light."

Applicant has amended claims 11 and 14 as suggested by the Examiner, thereby obviating the objection. Accordingly, Applicant respectfully requests withdrawal of the objection.

II. Response to Claim Rejections under 35 U.S.C. § 103

A. Sieber et al in view of Huston et al

Claims 1-3 and 5-9 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sieber et al in view of Huston et al.

The Examiner characterizes Sieber et al as disclosing a method for the measurement of a radiation dose utilizing a prompt emission of green light of the phosphor identical to the phosphor of the claimed invention.

The Examiner recognizes that Sieber et al does not teach measuring the light strength variation per unit time. To remedy this deficiency, the Examiner relies on Huston et al, which is said to teach that phosphors scintillate when exposed to ionizing radiation which advantageously permits real-time monitoring of ionizing radiation. The Examiner further states that inherent in real time monitoring is measurement as a function of time. It is the Examiner's position that it would have been obvious to one of ordinary skill in the art to measure the light strength variation per unit time in the method of Sieber et al in order to perform real time monitoring of the ionizing radiation as taught by Huston et al.

Applicant respectfully traverses the rejection and submits that the Examiner has not made a *prima facie* showing of obviousness.

The presently claimed invention is based on Applicant's discovery that the spontaneous green light emission, which is emitted by the claimed co-activated alkaline earth metal rare earth oxide phosphor of formula (I) when radiation or UV light is applied to the phosphor continuously, varies in its emission strength per unit time. This is illustrated in Figures 3, 6 and 7 in the present specification. Applicant points out that this continuous emission strength variation (in proportion to the radiation dose) of the phosphor was not known at the time the present application was filed. Further, the corresponding, but non-coactivated phosphor shows an acute increase of emission strength (which cannot be traced by a measuring device) within a very short time (that is, within a very small variation range of the radiation dose) and then the emission strength is kept on the same level. See Fig. 4 of the present specification. Thus,

apparently, the non-coactivated phosphor cannot be employed for measuring a dose of radiation or UV rays.

Therefore, since the continuous variation of the spontaneous green light emission of the co-activated phosphor of the formula (I) is not taught or suggested by Sieber et al and was not known at the time of the filing date of the present application, one of ordinary skill in the art would not have been motivated to combine Sieber et al with Huston et al with a reasonable expectation of success in achieving the claimed invention.

Accordingly, Applicant respectfully requests withdrawal of the rejection.

B. Sieber et al in view of Huston et al and further in view of Kastner et al

Claims 4 and 10 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sieber et al in view of Huston et al and further in view of Kastner et al. The Examiner asserts that the method of Sieber et al, as modified by Huston et al, lacks the step of preparing a calibration curve by applying a standard target radiation in a known dose. It is the Examiner's position that calibration is well known in the art as evidenced by Kastner et al and that it would have been obvious to one of ordinary skill in the art to apply a standard target radiation in a known dose in the modified method of Sieber et al in order to prepare a calibration curve to obtain measurements of the radiation to which the means is exposed.

Applicants respectfully traverse the rejection and submit that Sieber et al and Huston et al do not teach or suggest the claimed invention for the reasons set forth above as applied to claims 1-3 and 5-9. Kastner et al does not remedy the deficiencies of Sieber et al and Huston et al.

Thus, claims 4 and 10 are distinguished for at least the same reasons since claim 4 depends on claim 1 and claim 10 depends on claim 7.

Accordingly, Applicant respectfully requests withdrawal of the rejection.

C. Sieber et al in view of Dewaele and Arakawa

Claims 11-14 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Sieber et al in view of Dewaele and Arakawa. The Examiner states that Sieber et al discloses steps (a), (b) and (c) of the claimed invention.

Applicants respectfully traverse the rejection and submit that the Examiner appears to misunderstand the disclosure of Sieber et al. Sieber et al does not disclose the application of a target radiation to the phosphor “so as to cause variation of atomic valency for the terbium and samarium” as recited in the present claims. Sieber et al is silent as to the variation of atomic valency for terbium (Tb) and samarium (Sm) due to the application of radiation. See col. 3, line 25 to col. 4, line 18. Thus, Sieber et al does not even recognize and apparently has no knowledge of such a variation of the atomic valency for Tb and Sm due to the application of radiation, and therefore the method lacks the step of comparing the emission to an initial emission obtained by the application of ultraviolet rays before the application of the target radiation. Neither Daewale nor Arakawa remedies the deficiencies of Sieber et al. Thus, one of ordinary skill in the art would not have been motivated to combine Sieber et al, Daewale and Arakawa et al with a reasonable expectation of success in achieving the claimed invention.

Accordingly, Applicants respectfully request withdrawal of the rejection.

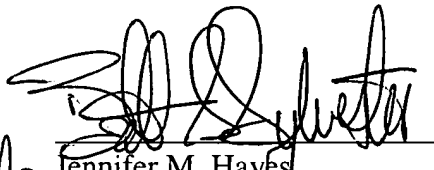
Amendment
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III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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